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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/915,658	08/21/1997	JIGISH D TRIVEDI	MIO024PA	1803

7590

10/22/2003

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EXAMINER

PERALTA, GINETTE

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant No.

08/915,658

Applicant(s)

TRIVEDI, JIGISH D

Examiner

Ginette Peralta

Art Unit

2814

-- The MAILING DATE of this communication appears on the reverse with the correspondence address --
 Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-922) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 31 to 35, 37, and 42-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Chung et al. (U. S. Pat. 5,094,981).

Chung et al. discloses in Figs. 1e and 2d, an interconnect that has a low contact resistance comprising a composite structure comprising a first metal silicide 38B, a second metal silicide 40B, and an intermetallic compound 36B comprising metal from the first metal silicide and metal from the second metal silicide; wherein the first metal silicide may comprise titanium silicide and the second metal silicide may comprise tungsten silicide (col. 7, l. 53-55), and the intermetallic compound 36B comprises titanium tungsten (TiW) (col. 4, ll. 55-68)).

Chung et al. further discloses a semiconductor device that comprises a substrate assembly having at least one semiconductor layer; at least one field effect transistor formed in the semiconductor layer, the field effect transistor having a source, a drain and a gate; and an interconnect comprising a composite structure comprising a first metal silicide 38B, a second metal silicide 40B, and an intermetallic compound 36B

comprising metal from the first metal silicide and metal from the second metal silicide; wherein the first metal silicide may comprise titanium silicide and the second metal silicide may comprise tungsten silicide (col. 7, l. 53-55), and the intermetallic compound 36B comprises titanium tungsten (TiW) (col. 4, ll. 55-68)).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 36, 38 to 41, and 46-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung et al. in view of Okamoto (U.S. Pat. 4,910,578).

Chung et al. discloses in Figs. 1e and 2d, an interconnect that has a low contact resistance comprising a composite structure comprising a first metal silicide 38B, a second metal silicide 40B, and an intermetallic compound 36B comprising metal from the first metal silicide and metal from the second metal silicide; wherein the first metal silicide may comprise titanium silicide and the second metal silicide may comprise tungsten silicide (col. 7, l. 53-55), and the intermetallic compound 36B comprises titanium tungsten (TiW) (col. 4, ll. 55-68)).

Chung et al. further discloses a semiconductor device that comprises a substrate assembly having at least one semiconductor layer; at least one field effect transistor

formed in the semiconductor layer, the field effect transistor having a source, a drain and a gate; and an interconnect comprising a composite structure comprising a first metal silicide 38B, a second metal silicide 40B, and an intermetallic compound 36B comprising metal from the first metal silicide and metal from the second metal silicide; wherein the first metal silicide may comprise titanium silicide and the second metal silicide may comprise tungsten silicide (col. 7, l. 53-55), and the intermetallic compound 36B comprises titanium tungsten (TiW) (col. 4, ll. 55-68)).

Chung et al. discloses the claimed invention with the exception of teaching a memory array.

Okamoto teaches in Fig. 4D an interconnect comprising a composite structure comprising a first metal silicide 4, a second metal silicide 8, and an intermetallic compound 10 comprising metal from the first metal silicide and metal from the second metal silicide; wherein the first metal silicide may comprise titanium silicide (col. 4, l. 43) and the second metal silicide may comprise tungsten silicide (col. 6, l. 49-51), and the intermetallic compound 10 comprises titanium tungsten (TiW) (col. 6, l. 64-66), and that the interconnect structure can be used in memory arrays, as memory arrays are well known to be LSI circuits as discussed in Okamoto.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the structure be a memory array, and that the interconnections taught by Chung et al. be used in such structures as the use of interconnections in a memory array is well known to one of ordinary skill in the art.

Furthermore, regarding the limitation of "an intermetallic compound formed by a reaction between said first metal silicide and said second metal silicide", the "formed by" part of the limitation is not considered since the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

Response to Arguments

5. Applicant's arguments with respect to claims 31-49 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginette Peralta whose telephone number is (703) 305-7722. The examiner can normally be reached on Monday to Friday 8:00 AM- 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-49188-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9306 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

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October 17, 2003


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